

1. 2016-1a

Circle or cross: "T" if True – "F" if False.

- T / F A clustered system can provide high-availability service.
- T / F The advantages of a multiprocessor system include: increased throughput, economy of scale, and increased reliability.
- T / F Android (Google) features middle-ware that supports (for example) Linux.
- T / F Microsoft Windows 10 provides only a GUI (Graphical User Interface) with no CLI (Command Line Interface).
- T / F Using the Windows Application Programing Interface (API), you can compile the same source code to run natively on either 32-bit Windows or 64-bit Windows.
- T / F Linux does not provide any Application Programing Interface (API).
- T / F Most modern operating systems – including Linux and Windows – have a kernel structure similar to that of a micro-kernel, but to implement that structure in the manner of a monolithic kernel.

2. 2016-1b

Circle or cross: "T" if True – "F" if False.

- T / F Virtual Machines are fully isolated from one another no Virtual Machine is aware of the presence of another Virtual Machine.
- T / F With containers, a host operating system is installed on the system first, and then a container layer is installed atop the host Operating Systems.
- T / F Software as a Service (SaaS) is a software stack ready for application use via the Internet (i.e. a database server).

3. 2016-2a

Circle or cross: "T" if True – "F" if False.

- T / F An Operating System is a software that manages the computer hardware (OSCE2).
- T / F The purpose of an Operating System is to provide an environment in which a user can execute programs in a convenient and efficient manner (OSCE2).
- T / F There are at least three types of programs, the kernel, system programs, and application programs (OSCE2).
- T / F Most prominent mobile Operating System features a core kernel along with middle-ware that support Data Base, Multimedia, Graphics, etc (OSCE2).
- T / F The Interrupt is a privilege instruction.
- T / F After interrupt, the system will be in non-privilege mode.

4. 2016-2b

Answer the following questions:

- (a) Name the three most common operating systems for personal computers!
- (b) Name the two most common operating systems for mobile devices!
- (c) A 64-bit DDR3 memory system has two transfers per cycle of a quadrupled (4x) clock signal. What is the transfer rate (in Mega-Bytes/second) if the memory clock-rate is 200MHz?
- (d) If the signal propagation is 300 000 km/s. How long (cm) is the wave-length of a 3GHz signal?

5. 2016-2c

- (a) Fill this following with "ASP" (Application Software Provider) or "SaaS" (Software as a Service)

| | |
|--|--|
| | a separate instance of the application is maintained for each business |
| | always Up-to-Date for the whole service |
| | closer to Legacy Software |
| | lacks scalability for the vendor |
| | supports multi-tenancy (multiple customers) |

- (b) Fill this following with "IaaS" (Infrastructure as a Service), "PaaS" (Platform as a Service), or "SaaS" (Software as a Service)

| | |
|--|------------------------|
| | CRM System |
| | Database Server |
| | GMAIL |
| | Google Apps |
| | Network |
| | Office 365 (Microsoft) |
| | Servers |
| | Storage |
| | Virtual Machines |
| | Webserver |

- (c) Fill this following with "Container", "Full Virtualization", "Hypervisor", or "Para Virtualization"

| | |
|--|--|
| | a complete simulation of the underlying hardware |
| | creates and runs virtual machines |
| | guests run a modified operating system |
| | LXC |
| | operating-system-level virtualization |

6. 2017-1a

Circle or cross: "T" if True – "F" if False.

- T / F** The von Neumann architecture describes a computer architecture with parts consisting of a Central Processing Unit (CPU); a Control Unit (CU); a Memory to store both data and instructions; external Mass Storage; and Input and Output mechanisms.
- T / F** An Operating System provides protected access to shared resources (UCB162).
- T / F** A program is an instance of a process that runs (UCB162).
- T / F** AMD64 (aka x64 or x86_64) is the 64-bit version of the x86 instruction set.
- T / F** An Operation System acts as an intermediary between the computer user and the computer hardware (OSC9).
- T / F** An Operating System as resource allocator manages the execution of user programs to prevent errors and improper use of the computer (OSC9).
- T / F** Android Operating Systems includes Linux as middleware.
- T / F** "Kernel mode" is also called "Supervisor mode" whereas "User mode" is also called "Privileged mode".
- T / F** System calls provide an interface to the Application Programming Interface (API).
- T / F** API specifies a set of functions that are available to an application programmer, including the passing parameters and return values.

7. 2017-1b

Circle or cross: "T" if True – "F" if False.

- T / F** If you use services like Facebook or GMail or Twitter, then you already use the cloud system.
- T / F** One of the essential Cloud Computing characteristics is "On Demand Self-Service".
- T / F** Amazon Elastic Compute Cloud (EC2) is an Electronic Commerce / Internet-based Retailer system.
- T / F** Organizations today have no choices: all technology-enabled business processes will be moved to the cloud.
- T / F** A disadvantage of Cloud Computing is that it requires a constant network connection.
- T / F** OpenStack is a software platform, mostly deployed as an Infrastructure-as-a-Service (IaaS).
- T / F** A Hypervisor is computer software, firmware, or hardware, that creates and runs virtual machines.
- T / F** There are three main Cloud Computing components: grid computing, utility computing, and autonomic computing.
- T / F** Cloud computing is always public cloud by definition.
- T / F** Any conventional OS distribution can be run on top of a paravirtualizing Hypervisor.

8. 2017-2a

(01) is a software that manages the computer hardware. Android is an open source (02) for (03) that includes a (04) kernel, (05), and key (06). A (07) is any hardware or software used to host an application or service. Anything between the kernel and user applications is considered as (08). A (09) is an abstraction in which common code providing generic functionality. (10) provide an interface to the services made available by an (11). The (12) specifies a set of functions that are available to an application programmer.

Match the number of the sentence above with these following phrases:

| | | | | | |
|--------------------------|---|--------------------------|------------------|--------------------------|----------------|
| <input type="checkbox"/> | Application Programming Interface (API) | <input type="checkbox"/> | Applications | <input type="checkbox"/> | Linux-based |
| <input type="checkbox"/> | Middleware | <input type="checkbox"/> | Middleware | <input type="checkbox"/> | Mobile Devices |
| <input type="checkbox"/> | Operating System | <input type="checkbox"/> | Operating System | <input type="checkbox"/> | Platform |
| <input type="checkbox"/> | Software Framework | <input type="checkbox"/> | Software Stack | <input type="checkbox"/> | System Calls |

9. 2017-2b

- In the von Neumann architecture, the **Central Processing Unit** consists of two main parts: the (01) and the (02).
- A (03) is a collection of **instructions**, while a (04) is the actual execution of those **instructions**.
- One **Hexadecimal** digit represents (05) binary bits, whereas one **Octal** digit represents (06) binary bits.
- A (07) uses a Page Table to map (08) **numbers** of (09) **memory** into (10) **numbers** of (11) **memory**.
- The most common use of (12) is **printing**. A (13) is a component that **stores data** so future requests for that data can be served **faster**. A (14) is used **temporarily** store data while it is being moved from one place to another.
- (15) means simultaneous or concurrently execution of **multiple processes**.
- The **three-state** process model is constituted of (16), (17), and (18).
- If a process is unable to change its state **indefinitely** because the (19) requested by it are being used by another waiting process, then the system is said to be in a (20).

Match the number of the sentence above with these following phrases:

| | | | | | | | |
|--------------------------|------------------------|--------------------------|--------------|--------------------------|-----------|--------------------------|------------------|
| <input type="checkbox"/> | Arithmetic Logic Unit | <input type="checkbox"/> | buffer | <input type="checkbox"/> | cache | <input type="checkbox"/> | computer program |
| <input type="checkbox"/> | Control Unit | <input type="checkbox"/> | deadlock | <input type="checkbox"/> | four (4) | <input type="checkbox"/> | frame |
| <input type="checkbox"/> | Memory Management Unit | <input type="checkbox"/> | multitasking | <input type="checkbox"/> | page | <input type="checkbox"/> | physical |
| <input type="checkbox"/> | process | <input type="checkbox"/> | ready | <input type="checkbox"/> | resources | <input type="checkbox"/> | running |
| <input type="checkbox"/> | spooling | <input type="checkbox"/> | three (3) | <input type="checkbox"/> | virtual | <input type="checkbox"/> | waiting |